

Deployable Ka/W Dual Band Cylindrical Parabolic Antenna Including Feed Support Structure, Phase I

Completed Technology Project (2017 - 2017)

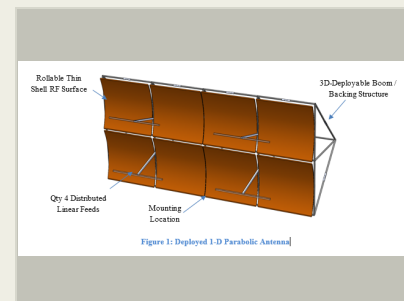
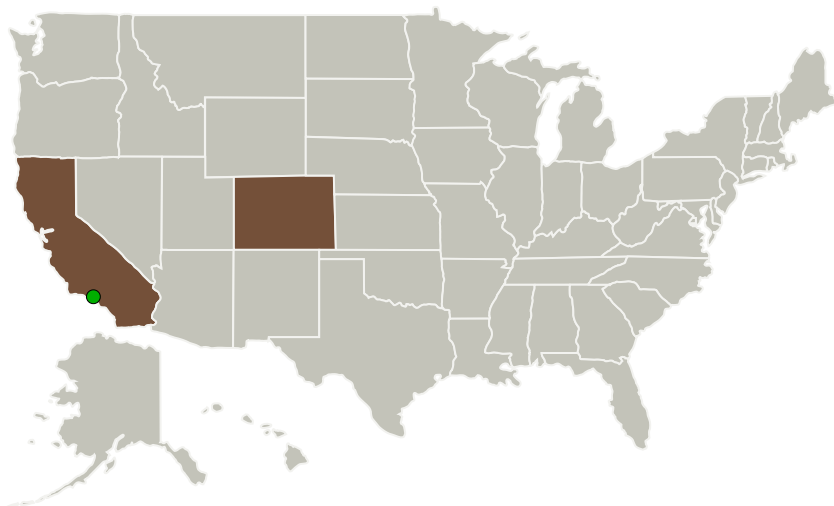


Project Introduction

The need for large radio frequency (RF) apertures in space has long driven technology developments that enable aperture sizes that exceed the allowable volume within a launch vehicle fairing. As the operating wavelength of these systems increases, the difficulty and cost grow exponentially. Large aperture high frequency antennas are of significant interest for science instruments and commercial communications. NASA weather and precipitation monitoring efforts utilize RF sensing instruments operating at Ka and W band frequencies. The proposed deployable high frequency antenna, will enable future satellite missions with one-dimensional parabolic dual frequency RF apertures operating at 35 GHz and 94 GHz in sizes ranging from <2 to 32 square meters (4 meters x 8 meters) and larger. This antenna will be adaptable to other government and commercial applications across a broad range of frequencies. The ~1 meter x 2 meter "module" can satisfy the needs of the following subtopics:

- Deployable Cylindrical Parabolic Antenna including Feed Support Structure
- o Supports dual frequency at 35 GHz and 96 GHz
- o Stows in 20 x 20 x 100 cm
- Deployable Cylindrical antenna
- o Supports 36 GHz
- Deployable W-band (94 GHz) antenna suitable for CubeSats and SmallSats
- o Supports SmallSats
- o Scalable to smaller apertures for CubeSats

Primary U.S. Work Locations and Key Partners



Deployable Ka/W Dual Band Cylindrical Parabolic Antenna including feed support structure, Phase I Briefing Chart Image

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Organizations Performing Work	Role	Type	Location
MMA Design LLC	Lead Organization	Industry	Loveland, Colorado
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Colorado

Project Transitions

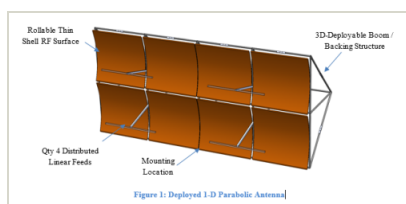
▶ **June 2017:** Project Start

✓ **December 2017:** Closed out

Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/140764>)

Images



Briefing Chart Image

Deployable Ka/W Dual Band Cylindrical Parabolic Antenna including feed support structure, Phase I Briefing Chart Image (<https://techport.nasa.gov/image/127308>)

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

MMA Design LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

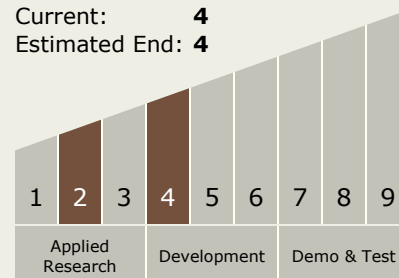
Carlos Torrez

Principal Investigator:

Christopher A Pelzmann

Technology Maturity (TRL)

Start: 2
Current: 4
Estimated End: 4



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Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.4 Microwave, Millimeter-, and Submillimeter-Waves

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System